



## BACKGROUND OF THE INVENTION

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### A SCREEN ASSEMBLY FOR A SHALE SHAKER

The present invention relates to a screen assembly, for a shale shaker, a panel for a screen assembly, a support structure for a screen assembly, a shale shaker comprising a screen assembly, a shale shaker comprising a support structure and a method for fitting a screen assembly into a shale shaker.

In the drilling of a borehole in the construction of an oil or gas well, a drill bit is arranged on the end of a drill string and is rotated to bore the borehole. A drilling fluid known as "drilling mud" is pumped through the drill string to the drill bit to lubricate the drill bit. The drilling mud is also used to carry the cuttings produced by the drill bit and other solids to the surface through an annulus formed between the drill string and the borehole. The drilling mud contains expensive synthetic oil-based lubricants and it is normal therefore to recover and re-use the used drilling mud, but this requires the solids, to be removed from the drilling mud. This is achieved by processing the drilling fluid. The first part of the process is to separate the solids from the solids laden drilling mud. This is at least partly achieved with a shale shaker, such as those disclosed in US 5,265,730, WO 96/33792 and WO 98/16328.

Shale shakers generally comprise an open bottomed basket having one open discharge end and a solid walled feed end. A number of rectangular screens are arranged in the basket, which are held in C-channel rails located on the basket walls, such as those disclosed in GB-A-2,176,424. The basket is arranged on springs above a receptor for receiving recovered drilling mud. A skip or ditch is provided beneath the open discharge end of the basket. A motor is fixed to the basket, which has a drive rotor provided with an offset clump weight. In use, the motor rotates the rotor and the offset clump weight,



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The present invention relates to a screen assembly, for a shale shaker, a panel for a screen assembly, a support structure for a screen assembly, a shale shaker comprising a screen assembly, a shale shaker comprising a support structure and a method for fitting a screen assembly into a shale shaker.

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things, a flat panel like portion having apertures therein and wing portions which are folded to form a support structure, which may be made from a single sheet of material. This rigid support has been assigned the  
5 Trade Mark "UNIBODY" by the applicants.

European Patent Publication Number 1 002 588, discloses a panel comprising a plurality of groups of perforations, each group comprising six generally equally triangular apertures arranged with their apices facing a  
10 central portion, wherein the apices of two opposing ones of said triangular apertures are spaced apart further than the apices of opposed ones of the remaining triangular apertures.

The layers of mesh in the screens wears out  
15 frequently and therefore needs to be easily replaceable. Shale shakers are generally in the order of 5ft wide and 10ft long. A screen of dimensions 4ft wide by 10ft long is difficult to handle, replace and transport. It is known to use two, three, four or more screens in a single  
20 shale shaker. A standard size of screen currently used is of the order of 4ft by 3ft. A pre-tensioned type of screen is generally easier and faster to replace than the hook strip type, as the layers of screening material do not need to be tensioned in the shale shaker. A pre-  
25 tensioned type of screen is especially easily and quickly replaceable when used in a shale shaker having rails provided with inflatable bladders, such as those disclosed in GB-A-2,176,424 to clamp the pre-tensioned type of screen in place.

BRIEF SUMMARY OF THE INVENTION  
30 The inventor has noted that the support structure for the screen assembly has to be very rigid. It is known to strip the layers of mesh off used screen assemblies and to replace the worn layers of mesh. However, this is a time consuming process conducted in a workshop. The  
35 inventor has also noted that all of the screen assembly

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#### BRIEF SUMMARY OF THE INVENTION

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BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWINGS

For a better understanding of the present invention, reference will now be made, by way of example, to the accompanying drawings, in which:

5 Figure 1 is a rear end view of a screen assembly in accordance with the present invention, , partly in cross-section and arranged in clamping rails of a shale shaker, the screen assembly comprising a panel, a support structure and a pull down member;

10 Figure 1A is a cross-sectional view of the panel shown in Figure 1;

Figure 1B is an end view of the pull down member shown in Figure 1;

Figure 1C is an end view of the support structure shown in Figure 1;

15 Figure 1D is a top plan view of the panel shown in Figure 1A fitted to the pull down member shown in Figure 1B;

20 Figure 1E is an underneath view of the panel shown in Figure 1A fitted to the pull down member shown in Figure 1B;

Figure 1F is a top plan view of the support structure as shown in Figure 1C;

Figure 1G is an enlarged top view of part of the panel shown in Figures 1 and 1D;

25 Figure 1H is a top plan view of a blank used in the construction of a panel in accordance with the present invention;

Figure 1I is a template used in the construction of the panel of the present invention;

30 Figure 2 is an exploded view of a screen assembly in accordance with the present invention, the screen assembly comprising layers of screening material, a panel and a support structure;

35 Figure 2A is an end schematic view of part of the screen assembly shown in Figure 2, the screen assembly

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWINGS

For a better understanding of the present invention, reference will now be made, by way of example, to the accompanying drawings, in which:

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member; and

Figure 5E is a side view of part of the preferred support member shown in Figure 5D.

DETAILED DESCRIPTION OF THE INVENTION  
Referring to Figure 1, there is shown a screen

5 assembly, generally identified by reference numeral 100. The screen assembly 100 comprises a panel 101, a support structure 102 and a pull down member 103. In use, the panel 101 would have at least one layer of screening material adhered or otherwise attached thereto.  
10 Typically, each layer of screening material comprises a layer of wire mesh. Typically, the panel 101 would have three layers of screening material lying one over the other, the lowermost layer of screening having larger openings and larger wires. In use, the screen assembly  
15 100 is arranged in clamping rails 104 and 105 of a shale shaker.

Referring to Figure 1A, 1D and 1G, the panel 101 is made from a 1.5mm mild steel plate. The panel 101 comprises an area 106 provided with a plurality of  
20 apertures, a left side portion 107 provided with no apertures and a right side portion 108 provided with no apertures. The plurality of apertures in area 106 comprises a plurality of triangular apertures and a plurality of circular openings.

25 The panel 101 is formed from a blank shown in Figure 1H. Lines 110 and 111 and fold lines 112 and 113 indicate the boundary of area 106 which will be provided with the plurality of apertures. The area 106, the left side portion 107 and right side portion 108, all lie in the  
30 same plane to form a flat top surface. Left side portion 107 and right side portion 108 extend the entire length of the panel 101. Wing portions 114 and 115 approximately 1cm wide extend the entire length of the panel 101. The wing portions 114 and 115 are folded downwardly to stand  
35 approximately at right angles to the top surface. The

member; and

Figure 5E is a side view of part of the preferred support member shown in Figure 5D.

#### DETAILED DESCRIPTION OF THE INVENTION

5 Referring to Figure 1, there is shown a screen assembly, generally identified by reference numeral 100. The screen assembly 100 comprises a panel 101, a support structure 102 and a pull down member 103. In use, the panel 101 would have at least one layer of screening  
10 material adhered or otherwise attached thereto. Typically, each layer of screening material comprises a layer of wire mesh. Typically, the panel 101 would have three layers of screening material lying one over the other, the lowermost layer of screening having larger  
15 openings and larger wires. In use, the screen assembly 100 is arranged in clamping rails 104 and 105 of a shale shaker.

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